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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,348	04/12/2001	Daniel Alan Brokenshire	AUS920010010US1	3792

35525 7590 09/24/2003

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AMINI, JAVID A	
ART UNIT	**PAPER NUMBER**
2672	6

DATE MAILED: 09/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/833,348	BROKENSHIRE ET AL.	
	Examiner	Art Unit	
	Javid A Amini	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-23 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-23 is/are rejected.

7)☒ Claim(s) 1-23 is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Response to Arguments

Applicant's arguments filed July 07, 2003 have been fully considered but they are not persuasive.

- Response to remarks on page 7, lines 20-28: Applicant states the Examiner agreed the rejection of claims 8, 11 and 12 was not correct. Examiner's reply: Examiner agreed to remove the rejection if Applicant submits an explanation for claims 8, 11 and 12. The explanation should explicitly emphasis:
    1. The advantages of primary bus and a secondary bus over prior art?
    2. What are the advantages having (NIC), while the claim 7, discloses "a data processing system"?
    3. What are the characteristics of processor unit and memory that is located in a graphics adapter?
- Response to remarks on pages 9 and 10, lines 19-23;11-19: Applicant argues that the reference Warren et al. do not teach or suggest applying a gamma correction to the graphics data on a primitive basis to form the antialiased lines as claimed. In contrast, Warren et al. teach the limitation in (col. 5, lines 47-58) and also see Figs. 1-2.
- Examiner's note: Warren et al. teach not only the resulting primitives defining lines, but also the resulting primitives defining (points, lines, polygons, polyhedra, and the like) supplied by the geometry unit. The scan conversion unit generates pixel data based on the received primitives by interpolating straight lines so that each intermediate value need not be individually and separately calculated by the

geometry subsystem. The pixel data is then sent to the rasterization unit, where Z-buffering, blending, texturing, and antialiasing functions are performed.

- Response to remarks on page 11, lines 6-8: Applicant argues the present invention avoids color intensity dampening. Examiner's reply: Warren et al. in Figs. 1 and 5 illustrate, that there is no color intensity dampening in the invention.
- The rejection of pervious office action is still maintained.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-7, 13-18,19-20, 22 and 23 rejected under 35 U.S.C. 102(e) as being anticipated by Warren et al.

1. Claim1.

"A method in a data processing system for antialiasing lines for display, the method comprising: receiving graphics data for display, wherein the graphics data includes primitives defining lines; applying a gamma correction to the graphics data on a per primitive basis to form the antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and displaying the antialiased lines", as applicant in the specification page 2, lines 5-10, discloses a primitive is a graphics element that is used as a building block for creating images, such as, a point, a line, a polygon, or text. Warren et al. in Fig. 9 and in (col. 10, lines 51-54) teach the

pixel data is then sent to the rasterization unit 906, where Z-buffering, blending, texturing, and antialiasing functions are performed. And also discloses in abstract that the gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels. Also see (col. 9, lines 44-65) The geometry unit 902 converts the graphical data from the processor 804 into a screen coordinate system and performs projection and transformation processes to give depth to a displayed object. The resulting primitives (points, lines, polygons, polyhedra, and the like) supplied by the geometry unit 902 are then provided to the scan conversion unit 904.

2. Claim 2.

"The method of claim 1, wherein the gamma correction is performed using a gamma correction table", Warren discloses in Fig. 1 B an exemplary gamma correction curve 104 for mapping pixel intensities to input voltages of a display device. In display systems, the gamma correction curve 104 may be implemented as a lookup table, which samples and stores pixel intensities and associated input voltages. The pixel intensities produced are used as indices to select the associated input voltages stored in the lookup table.

3. Claim 3.

"The method of claim 1, wherein the gamma correction is performed using a gamma correction function", Warren illustrates in Fig. 5B a graph 550 of a gamma correction curve 552 for illustrating a generic partitioning scheme in accordance with one embodiment of the present invention. The gamma correction curve 552 plots normalized look-up value (e.g., electron gun

voltage, gamma-corrected value, etc.) as a function of intensity levels from 0 to N.sub.SN. The gamma correction curve 552 is partitioned into N segments.

4. Claim 4.

"The method of claim 2, wherein the gamma correction table is specified by an application and loaded into a graphics subsystem processing the graphics data for display within the data processing system", Warren discloses in (col. 3, lines 45-49) gamma correction is performed on the set of pixel data by accessing a stored pixel value in one of the N segments, in response to the pixel data, to generate gamma corrected pixel data.

5. Claim 5.

"The method of claim 3, wherein the gamma correction function is specified by an application and loaded into a graphics subsystem processing the graphics data for display within the data processing system", see rejection of claim 4.

6. Claim 6.

"The method of claim 1, wherein the applying step comprises: adjusting intensity of pixels defining the primitives", as applicant discloses in the specification page 2, lines 5-10, a primitive is a graphics element that is used as a building block for creating images, such as, a point, a line, a polygon, or text. Warren et al. disclose in abstract that the gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels.

7. Claim 7.

"A data processing system comprising: a bus system; a communications unit connected to the bus, wherein data is sent and received using the communications unit; a memory connected to the bus system, wherein a set of instructions and data including a gamma correction table are located in the memory; and a processor unit connected to the bus system, wherein the processor unit executes the set of instructions to receive graphics data for display, wherein the graphics data includes primitives defining lines; apply a gamma correction to the graphics data on a per primitive basis to form antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and display the antialiased lines", Warren et al. illustrate in Fig. 9 the pixel data is then sent to the rasterization unit 906, where Z-buffering, blending, texturing, and antialiasing functions are performed. And also discloses in abstract that the gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels.

8. Claim 13.

"A data processing system for antialiasing lines for display, the data processing system comprising: receiving means for receiving graphics data for display, wherein the graphics data includes primitives defining lines; applying means for applying a gamma correction to the graphics data on a per primitive basis to form the antialiased lines, wherein the gamma correction is applied only to the primitives defining lines; and displaying means for displaying the antialiased lines", Warren et al. illustrate in Fig. 9 the pixel data is then sent to the rasterization unit 906, where Z-buffering, blending, texturing, and antialiasing functions are performed. And

also discloses in abstract that the gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels.

9. Claim 14.

"The data processing system of claim 13, wherein the gamma correction is performed using a gamma correction table", Warren discloses in Fig. 1 B an exemplary gamma correction curve 104 for mapping pixel intensities to input voltages of a display device. In display systems, the gamma correction curve 104 may be implemented as a lookup table, which samples and stores pixel intensities and associated input voltages. The pixel intensities produced are used as indices to select the associated input voltages stored in the lookup table.

10. Claim 15.

"The data processing system of claim 13, wherein the gamma correction is performed using a gamma correction function", Warren illustrates in Fig. 5B a graph 550 of a gamma correction curve 552 for illustrating a generic partitioning scheme in accordance with one embodiment of the present invention. The gamma correction curve 552 plots normalized look-up value (e.g., electron gun voltage, gamma-corrected value, etc.) as a function of intensity levels from 0 to N.sub.SN. The gamma correction curve 552 is partitioned into N segments.

11. Claim 16.

"The data processing system of claim 14, wherein the gamma correction table is specified by an application and loaded into a graphics subsystem processing the graphics data for display within

the data processing system", Deering discloses in paragraph 0014, the sample-to-pixel calculation unit filters samples based on a filter function which may be centered over a current pixel location in the screen space. The filter function has an associated domain of definition referred to herein as the filter support or filter extent.

12. Claim 17.

"The data processing system of claim 15, wherein the gamma correction function is specified by an application and loaded into a graphics subsystem processing the graphics data for display within the data processing system", Warren discloses in (col. 3, lines 45-49) gamma correction is performed on the set of pixel data by accessing a stored pixel value in one of the N segments, in response to the pixel data, to generate gamma corrected pixel data.

13. Claim 18.

"The data processing system of claim 13, wherein the applying means comprises: means for adjusting intensity of pixels defining the primitives", Warren et al. disclose in abstract that The gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels.

14. Claim 19.

"A computer program product in a computer readable medium for antialiasing lines for display, the computer program product comprising: first instructions for receiving graphics data for display, wherein the graphics data includes primitives defining lines; second instructions for applying a gamma correction to the graphics data on a per primitive basis to form the antialiased

lines, wherein the gamma correction is applied only to the primitives defining lines; and third instructions for displaying the antialiased lines", Warren et al. illustrate in Fig. 9 the pixel data is then sent to the rasterization unit 906, where Z-buffering, blending, texturing, and antialiasing functions are performed. And also discloses in abstract that the gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels.

15. Claim 20.

"An apparatus comprising: an input, wherein position information for a pixel is received at the input; a coverage interpolation unit connected to the input, wherein the coverage interpolation unit generates a coverage valued at a first output in which the coverage value identifies how much of the pixel is covered at a first output; an alpha interpolation unit connected to the input, wherein the alpha interpolation unit identifies a degree of transparency for the pixel as an opacity value at a second output; a color interpolation unit connected to the input, wherein the color interpolation unit generates a red, green, and blue value for the pixel at a third output; a gamma correction unit connected to the first output, wherein the gamma correction unit generates a gamma corrected value for the pixel using the coverage value at a fourth output, wherein the gamma correction is applied only to the primitives defining lines; a modulate unit, wherein the modulate unit is connected to the second output and the fourth output, wherein the modulate unit adjusts the gamma corrected value to the opacity value to generate an adjusted gamma corrected value at a fifth output; a frame buffer having a sixth output, wherein the frame buffer holds a

final pixel value; and a blend unit connected to the fifth output and the third output, wherein the blend unit blends the adjusted gamma corrected value and the red, green, and blue value for the pixel with a current pixel value from the sixth output of the frame buffer to form the final pixel value for display", Warren et al. illustrate in Fig. 9 the pixel data is then sent to the rasterization unit 906, where Z-buffering, blending, texturing, and antialiasing functions are performed. And also discloses in abstract that the gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels.

16. Claim 22,

"A method in a data processing system for antialiasing lines for display, the method comprising: generating graphics data for display; determining whether the graphics data comprises a line; if the graphics data comprises a line, sending the graphics data to an adapter; applying a gamma correction to the graphics data to form an antialiased line". Warren et al. illustrate in Fig. 9 the pixel data is then sent to the rasterization unit 906, where Z-buffering, blending, texturing, and antialiasing functions are performed. And also discloses in abstract that the gamma correction curve table includes a specified total number of intensity levels associated with gamma corrected pixel values with one intensity level per pixel value. The method includes partitioning the gamma correction curve table into N segments such that each of the N segments is associated with a set of intensity levels from the specified total number of intensity levels.

17. Claim 23,

"The method of claim 22, wherein gamma correction is applied only to pixel generated for the line by a rasterization engine". Warren et al. in Fig. 9 and in (col. 9, lines 43-65) teach the limitations.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

18. Claims 9, 10, 21 rejected under 35 U.S.C. 103(a) as being unpatentable over warren, and further in view of Deering.

19. Claim 9.

"The data processing system of claim 7, wherein the processor unit includes a single processor", the step is obvious because some computer has one processor and some has multi processor.

20. Claim 10.

"The data processing system of claim 7, wherein the processor unit includes a plurality of processors", the step is obvious because some computer has one processor and some has multi processor.

21. Claim 21.

"The apparatus of claim 20, wherein the gamma correction unit is connected to the first output of coverage interpolation unit by a clamp, wherein the clamp prevents values generated by the coverage interpolation unit from going out of a selected range of values", Warren does not teach,

however the step is obvious because Deering discloses in paragraph 0147 that the samples may be offset by a random angle (e.g., from 0.degree. to 360.degree.) and a random distance, or by random x and y offsets, which may or may not be limited to a predetermined range.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Warren into Deering in order to specify a substantial need for a system and method, which could provide for unity gain in the filtering process (i.e. in the process of generating pixel values from sample values) in a manner, which is flexible and efficient.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

22. Claims 8, 11, 12 rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Antialiasing and gamma correction are critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Applicant is claiming a bus system, which is a set of hardware lines (conductors) used for data transfer among the components of a computer system in claim 8. Applicant is claiming the communication unit (NIC) in claim 11, and also is claiming the processor and memory that are located in graphic adapter or controller. Note: most of graphics adapter are equipped with processor unit and memory chips.

Interpretation note: (use of the look-up table in general manner is called gamma correction, see Computer graphics: principles and practice, second edition in C, Foley pp. 564-565; the term "filter" or "convolve" are also used).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A Amini whose telephone number is 703-605-4248. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 703-305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-8705 for regular communications and 703-746-8705 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

Javid A Amini
Examiner
Art Unit 2672

Javid Amini
September 15, 2003